

Abstract

In my creative research culminating in my MFA final thesis, I examine the neuroscience of creativity through the lens of the body and the medium of dance. To better understand this intersection of science and art, and the relationship between the brain and the body, this research serves to inform my choreographic practice, providing a deeper understanding that will ultimately also influence my teaching practice.

Something Borrowed, Something New is a choreographic project that approaches the creative process through three distinct cognitive operations which underlie innovative thinking, all of which involve taking the experiential and informational raw materials around us and applying these principles to create new outcomes. The performance combines classical ballet with contemporary dance techniques as these two forms have been the most influential in the development of my artistic practice. Part I examines the abstraction of ballet, where two existing classical ballet female solo variations are modified and twisted to create something new. Using contemporary dance techniques, Part II explores fragmentation, where sequences and motifs are taken apart, expanded on, and rearranged. Part III employs convergent thinking, where two or more sources, ideas, and dance forms are merged. The written thesis details the steps along the choreographic process and provides contextual and analytical support to the final performance. Lastly, I discuss how this research will contribute and lead to future choreographic endeavors.

MONTCLAIR STATE UNIVERSITY

Something Borrowed, Something New:

A Cognitive and Experiential Exploration of the Creative Process

by

Joyce Lo

A Master's Thesis Submitted to the Faculty of

Montclair State University

In Partial Fulfillment of the Requirements

For the Degree of

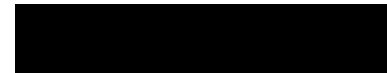
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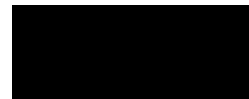
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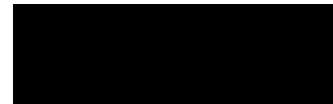
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PROCESS

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Introduction

My earliest memory of my interest in neurobiology came from a remark that someone made, “You’re left-handed. You must be incredibly creative.” I had not thought of myself as being particularly creative because having spent most of my early years of dancing at a rigorous ballet school, I received exceptional technical training but did not come across very many creative output opportunities. Later, when I began to delve into contemporary dance and was introduced to dance improvisation and choreography, I was in awe of how my teachers and peers could seemingly pull ideas out of thin air, a sudden flash of brilliance enabling them to arrange a symphony of dancers to move across the stage. How did they imagine so many steps so effortlessly, and more importantly, how could I learn to do the same?

My thesis project was initially inspired by the research presented by neuroscientist David Eagleman and music composer Anthony Brandt in their book *The Runaway Species: How Human Creativity Remakes the World*. Observing the intersection of art and science, I applied their concepts of *bending*, *breaking*, and *blending* to the creation of a dance performance. The process, which involved taking the experiential and embodied knowledge of my performers as raw materials and applying these principles, created new outcomes that blended my balletic roots with contemporary movement. My goal is that the knowledge developed from this choreographic process, along with research conducted on neuroplasticity and the creative process of established choreographers, will provide a deepened understanding of our capacity for creativity -- how to cultivate it, develop it as a learned skill, and how to share it through my teaching practice.

Research

I have performed significant research on neuroscience related to dance and the moving body. This has had a major influence on both my teaching and choreographic practices. I delved very specifically into the concept of *bend*, *break*, and *blend* developed by Anthony Brandt and David Eagleman to devise a methodology in which these cognitive processes guided my approach to collaborating with other artists and ultimately creating my final thesis performance. Additionally, I studied the creative processes of other female choreographers to better understand their perspectives on accessing, cultivating, and sharing creativity, particularly ones whose work blends elements of ballet and contemporary dance which I also seek to do.

Neuroscientific Research and Dance

My interest in combining neuroscientific research with dance began out of inspiration from Wayne McGregor and his use and understanding of physical thinking and embodied cognition. After watching his TED Talk a few years ago where he worked with two dancers to build a dance phrase in less than 15 minutes, I was left hungry to know more. In his talk, he stated, “I think the technicities of creativity can be taught and shared, and I think you can find out things about your own personal physical signature, your own cognitive habits, and use that as a point of departure to misbehave beautifully” (McGregor 0:22). To learn more about this concept of physical thinking and cultivating creativity, I reviewed research on the neuroscientific relations between cognitive thinking and body intelligence.

Sandra C. Minton and Rima Faber, in their book *Thinking with the Dancing Brain*, assert that “movement is the embodiment of thought” (1). Although one’s actions

are directed by thought, movement, inversely, also influences cognition. “Since the mid-nineteenth century, it has been known that separate areas of the brain provide different functions. The left and right hemispheres of the brain are not symmetrical and have neurons that are specialized” (Minton and Faber xvii), hence the emergence of left brain/right brain personality traits and stereotypes. The concept of brain localization – where brain functions are thought to be controlled strictly by specific sections of the brain – was once a commonly held view, however, “contemporary understanding of the brain through imaging demonstrates an orchestrated model” (Minton and Faber xvii). While specific areas may contribute to various thought processes, “brain areas function in symphonic harmony, which results in specific behaviors or emotions” (Minton and Faber xvii).

Within the study of cognitive science, “There is a branch...called embodied cognition that recognizes thought is unified with the body; that it does not arise from the brain or body alone, but is shaped by experiences enacting with the body” (Minton and Faber 121). Through embodied exploration, neural connections are developed that synthesize contextual information with the body’s kinesthetic sense. Considering that the brain is an internal organ that sits in complete darkness, everything that it receives, processes, and interacts with, is stimuli and sensory information that is first and foremost experienced through the body. Bill Bryson, in his book *The Body: A Guide of Occupants* writes, “The great paradox of the brain is that everything you know about the world is provided to you by an organ that has itself never seen that world. The brain exists in silence and darkness, like a dungeon prisoner. It has no pain receptors, literally no feelings” (48). Arguably, our brain’s orchestration of the sensory and neurological

systems “quite literally creates—a vibrant, three-dimensional, sensually engaging universe” (Bryson 49).

Somatic practices, such as the Alexander Technique, Feldenkrais Method, and Bartenieff Fundamentals, have become integrated with dance training because they not only teach dancers to move with more functionally efficient actions, but also serve as a way to optimize the body and mind relationship. “Conscious integration of body and mind facilitates deep neurological patterning of movement... the coordinated use of the mind produce[s] physical changes” (Minton and Faber 6). This symphonic harmony that is observed in the brain, therefore, extends and is intricately connected to the body, both neurologically and physically.

Beyond dance training, combining motor and cognitive functions has also proven “to reinforce learning, improve memory and retrieval, and enhance learner motivation and morale” (Merrick and Lesiman 4). John Dewey, an American philosopher, psychologist, and educational reformer “was pivotal in shaping the idea that learning is most effective through active involvement as opposed to passively sitting” (Minton and Faber 119). With active learning, the whole brain is involved. “It simultaneously links and reinforces experiences in multiple brain areas: concrete sensory information in the parietal lobe, abstract concepts in Broca’s and Wernicke’s left temporal areas, spatial relationships in the right temporal lobe, and emotions in the amygdala” (Minton and Faber 120). Hence, the kinesthetic nature of dance education and practice not only improves fine and gross motor abilities, it also produces neural growth. Movement facilitates an orchestration in the brain that deepens the learning experience and promotes understanding by connecting content with meaning.

Learning is intrinsically connected to the phenomenon of memory – “it is difficult to engage in one without partnering the other” (Minton and Faber 77). While the brain has the ability “to absorb, store, and recall information” (Minton and Faber 77), it is important to note that the information that the brain stores is malleable and subject to change. “Memories are plastic. Once recorded, they can [and almost inevitably do] change and [are] rearranged by new experiences, especially experiences related to an original memory trace” (Minton and Faber 77). While conventional wisdom once suggested that “*neurogenesis*—the birth of new brain cells—ceased soon after [infancy],” research performed in more recent decades has shown that the brain instead “possesses the remarkable capacity to reorganize pathways, create new connections, and, in some cases, even create new neurons—a concept called neuroplasticity” (Cherry, “What Is Neuroplasticity”). Kendra Cherry, in her article “What is Neuroplasticity?” explains that “plasticity is ongoing throughout life” and “can occur as a result of learning, experience, and memory formation, or as a result of damage to the brain.”

It is arguably this plasticity that allows the brain to alter what it already knows, thus giving rise to human creativity and innovation. Anthony Brandt and David Eagleman, in their book *The Runaway Species*, explain, “Human creativity does not emerge from a vacuum. We draw on our experience and the raw materials around us to refashion the world. Knowing where we’ve been, and where we are, points the way to [where we go] next” (38). Brandt and Eagleman propose “a framework that divides the landscape of cognitive operations into three basic strategies: bending, breaking, and blending. [They] suggest these are the primary means by which all ideas evolve” (47).

Bend, Break, Blend**Bend**

Brandt and Eagleman describe bending as when “an original is modified or twisted out of shape” (48). Examples of bending can be seen in abundance throughout art history, such as Claude Monet’s paintings of “more than thirty views of the [Rouen Cathedral’s] front entrance” (Brandt and Eagleman 55), and Katsushika Hokusai’s “thirty-six woodblock prints, depicting [Japan’s Mount Fuji] in different seasons, from different distances, and in different visual styles” (Brandt and Eagleman 56). Bending can remodel a source by changing the size of something – expanding or contracting objects not only for novelty but also to problem solve, such as when polarized windshields were invented by shrinking calcite crystals so that they could be embedded into glass. Shape can also bend. Dancers who are familiar with the work of Martha Graham may know that in “Lamentation,” Graham “used innovative poses, movements and fabric to bend the human form” (Brandt and Eagleman 61).

By modifying quality, objects that were traditionally hard could be made soft or vice versa. The industry of soft robotics used this concept to create inflatable and squishy robots “much lighter than conventional models and use less battery power - yet...can walk and support more than ten times its weight” (Brandt and Eagleman 63). The experience of time is another way bending can be utilized as brains are constantly playing variations on a theme. Movies use slow and fast motion to exaggerate and emphasize certain elements, while “programming [a] pulseless heart to subtly speed up and slow down” provided a solution to prevent blood clots from forming to reduce the risk of stroke (Brandt and Eagleman 64). One can see from these examples that the manipulation

of time involving chronology is seen to be used in both artistic and scientific bending. “Although it defies our lived experience, the reversal of time unmasked a new way” to understand the world (Brandt and Eagleman 65).

In looking at the myriad of ways humankind has used bending to create and recreate, it becomes clear that “the end of time illusion, in which we convince ourselves that everything that can be done has already done” (Brandt and Eagleman 68) is not the entire truth. Umbrellas have existed since ancient times, yet “the United States Patent Office continues to receive so many patent applications for umbrellas that it has four full-time examiners to review them” (Brandt and Eagleman 69). In the arts, jazz musicians play standards hundreds of times, yet each performance is unlike another. Rather than reaching for any sort of definitive end, the goal is a continual renewal, never playing the same song in the same way. “Bending is a makeover of an existing prototype, opening up a wellspring of possibilities through alterations.... As a result of our perpetual neural manipulations, human culture incorporates an ever-expanding series of variations on themes passed down from generation to generation” (Brandt and Eagleman 73).

Break

Brandt and Eagleman describe the cognitive process of breaking as when “something whole...is taken apart, and something new [is] assembled out of the fragments” (74). It is a cognitive strategy so commonly used and incorporated so easily into many facets of everyday living that it is often taken for granted. In language, we use shortened words and acronyms with ease; in movies, temporal flow is broken through the use of scene cuts and the creation of montages for narrative compression. This cognitive strategy is responsible for the innovation of cell phone technology and digital pixelation,

as well as scientific advancements such as breaking up DNA strands to achieve gene-sequencing success.

Artists in various disciplines have also used this technique of breaking apart something that is whole, keeping some pieces while allowing other parts to be discarded. In Cubism, artists Georges Braque and Pablo Picasso “brought different views of subjects (usually objects or figures) together in the same picture, resulting in paintings that appear fragmented and abstracted” (“Cubism”). Johann Sebastian Bach fragmented the theme in his “Fugue in D-Major from *The Well-Tempered Clavier*” (Brandt and Eagleman 85), using the final four notes from this section and overlapping them multiple times “to produce a rapid, beautiful mosaic of fragments” (Brandt and Eagleman 86). Blackout poetry - a type of poetry where a pre-existing piece of text such as a newspaper article or book is altered by redacting and blacking out words to create a new poem - is another example of this technique. “Breaking enables us to take something solid or continuous and fracture it into manageable pieces. Our brains parse the world into units that can then be rebuilt and reshaped” (Brandt and Eagleman 90).

Blend

“In blending, the brain combines two or more sources in novel ways” (Brandt and Eagleman 91). Mythical creatures from the Sphinx to mermaids were created by combining humans with animals, as are modern-day superheroes such as Batman and Spiderman. Mark Turner and Gilles Fauconnier, who brought to prominence the theory of conceptual blending in their book *The Way We Think*, “define conceptual blending as a deep cognitive activity that ‘makes new meanings out of old’” (Nordquist). This is achieved by combining “words, images, and ideas in a network of ‘mental spaces’ to

create meaning” (Nordquist). Aside from creating new meaning, human brains blend also for novelty and innovation. In Brazil, a popular sport called *futevolei* blends soccer with volleyball.

Blending can occur with sources that are juxtaposed but also create mergers in which the original sources become difficult to separate. For example, “In the Middle Ages, European composers created vocal pieces in which different texts were sung simultaneously. Languages [and content] were even mixed” (Brandt and Eagleman 98). Contrastingly, the creation of bronze alloy, “which became the material of choice for weaponry and armor [in the Bronze Age]” (Brandt and Eagleman 102) was through a surprising yet seamless blend of two soft metals: copper and tin. Mark Turner concurs in an interview with *Brain World Magazine* that “[blending] enlarges the power of every other tool in the toolbox and dramatically changes what we can accomplish.... the human brain [is] constantly trying to blend different things, unconsciously. Any two ideas activated simultaneously in the mind are candidates for blending” (Haire).

Bending, breaking, and blending are three strategies the brain uses to turn knowledge and experiences into novel output. “By intertwining the Bs, human minds ply, split, and merge their experiences into new forms” (Brandt and Eagleman 106).

Study: Female Classical/Contemporary Choreographers

The focus of this study was on four female ballet choreographers whose works blur the line between classical ballet and Western contemporary dance forms: Bronislava Nijinska, Twyla Tharp, Helen Pickett, and Pam Tanowitz. I investigated what driving motivations were behind their respective works, what their individual viewpoints on creativity were or are, and how they cultivated, accessed, and shared their creative

practices. I chose to specifically focus on female choreographers who worked in the ballet realm because there has always been a marked disparity between the number of male and female ballet choreographers in the industry due to a multitude of ballet-specific causes: the lack of creative development and composition practice offered in ballet training, and the stereotypes that encourage females to fit in and the males to stand out, for females to nurture and teach and for males to break the mold and take risks, etc. In studying how these four female choreographers were able to defy the odds and successfully navigate and create a pathway for themselves, I endeavor to integrate their experience and knowledge into my choreographic approach.

Bronislava Nijinska

Bronislava Nijinska was born in Minsk on January 9, 1891 (Beard). Her parents, both Polish dancers, introduced her and her brother Vaslav to dance at an early age. Nijinska and her brother joined the Imperial Ballet School in St. Petersburg and later left to join the radical ballet group founded by Serge Diaghilev, the Ballets Russes. Her work there was often overshadowed by that of her brother, for Vaslav Nijinsky was a dancer and choreographer “of prodigious talent” (Beard). Still, Nijinska’s pioneering choreography and movement philosophy at the time paved the way for what later became neo-classicism in ballet. Arguably, she was the first to develop abstract ballets, a decade before George Balanchine began to do so in the United States. Her “plotless” compositions “foregrounded the idea that movement is the essence of dance” (Beard). Whereas movement was previously “used in service to the final aim of achieving complete positions which could be held and admired” (Beard), Nijinska disagreed with the notion of ballet being about positions. Instead, she focused on motion.

Dance critic Anna Kisselgoff wrote in an article for *The New York Times* that Nijinska “st[ood] firm against the view that ballet is merely a series of steps and she attack[ed] those who wish[ed] to teach it as a fossilized form. Yet, she also st[ood] by the classical ballet idiom as a grammar of movement.” There were no contradictions between these two notions for her because “she rejected the idea of the classical tradition as static. Instead, she believed, classicism could stay alive only if it underwent change” (Kisselgoff). As a choreographer, her search for new forms was not to create a new idiom like Isadora Duncan and other modern dancers, but rather a deeper exploration of how the classical tradition could evolve.

Aside from cultivating her philosophies and legacy through choreography, Nijinska was also an extraordinary teacher. In 1919 she opened up her school, the School of Movement in Kyiv, Ukraine, where she was able to teach according to her principles (Beard). It was a short-lived experience as she soon went back to rejoin Diaghilev but later went on to teach a range of students -- “from Ninette de Valois to Maria Tallchief and Allegra Kent” (Kisselgoff). Teaching, for Nijinska, was a way to extend the creativity she was cultivating for the stage. Kisselgoff explained, “In this respect, she presage[d] the views of American modern-dance pioneers like Martha Graham, and she argue[d] that new movements devised by choreographers will find their way back into classroom training.” New movements created for the stage were not separate from the training she provided. Ninette de Valois, who later went on to establish the Royal Ballet and the Royal Ballet School, noted that “Nijinska’s classes were not for anyone wishing to warm up or perfect the basics simply because they were ‘avant-garde’ -- that is, creative sessions” (Kisselgoff).

Twyla Tharp

According to the *Encyclopedia of World Biography*, “Twyla Tharp was born in Portland, Indiana, on July 1, 1941,” but moved to Rialto, California at a young age. She started dance lessons at the Vera Lynn School of Dance in San Bernardino, California, but “also studied violin, piano, drums, Flamenco dancing, castanets, cymbals, and baton twirling...” (“Twyla Tharp Biography”), eventually adding ballet to the list. Becoming a professional dancer was not her initial intention, but after attending Pomona College for a year she transferred to Barnard College in New York City to study ballet, modern, and jazz (“Twyla Tharp”). Tharp joined the Paul Taylor Dance Company when she graduated but left soon after to form her own company and create her own works. The rest is history. “Ms. Tharp has choreographed more than one hundred sixty works: one hundred twenty-nine dances, twelve television specials, six Hollywood movies, four full-length ballets, four Broadway shows, and two figure skating routines. She received one Tony Award, two Emmy Awards, nineteen honorary doctorates, the Vietnam Veterans of America President’s Award...” (“Twyla Tharp Biography and Timeline”), and many more. It would seem that after all these years, she has found access to an endless well of creative juices and perhaps may hold the answer as to how other aspiring choreographers can find this same well. However, Tharp strongly believes that creativity does not equate to a sense of effortless accomplishment, but is instead cultivated by practice.

In conversation with Diane Coudu for an article in *Harvard Business Review*, Tharp explains, “I think everyone can be creative, but you have to prepare for it with routine.... The best creativity is the result of habit and hard work. And luck, of course.” In her book *The Creative Habit: Learn It and Use It For Life*, she reveals the rigor and

reverence she places on her routines, emphasizing the importance of being prepared to be creative. Like Nijinska, she also used an array of existing materials, ideas, and codified movements, but she became a master at blending the old with the new. Things that were seemingly unrelated – like ballet and the Beach Boys, Baryshnikov, and comedy – Tharp wove together to reinvent and reinvent again.

Having created more than one hundred different works, it might be easy for repetition and routine to take over. Coutu notes that Tharp had often followed one dance piece by launching the next one as far as possible in the opposite direction as a way to avoid this problem. Tharp affirms this, saying, “I’m not interested in repeating my experience, successful or otherwise. You can’t allow yourself to get comfortable with what you’re comfortable with, because then that’s all you’ll want to do.” Change, therefore, is what continues to drive her work. It is intentional and also habitual for Tharp, just as her creative practice is.

Helen Pickett

Helen Pickett was born in San Diego, California and later moved to San Francisco (Helen Pickett). While she was a student at the San Francisco Ballet School, she encountered William Forsythe who was creating a piece for the company and was drawn by his “method of inviting dancers to bring their voices to the creative process, and discovering new movement ideas together...” (Bond Perry). She joined Forsythe’s Frankfurt Ballet in 1987 and danced with the company until 1998, when a dislocated knee signaled her retirement, though she promptly went on to join the Wooster Group, a New York-based experimental theater company (Bond Perry). Pickett’s voice as a ballet choreographer is distinguished from others by her masterful takes on narrative ballet. Jen

Peters, in an article for *Dance Magazine*, states that “Helen Pickett’s storytelling ideology was shaped by her parents, who were both actors. As a performer, ‘stories always meant more in my skin and my body,’ explains Pickett.” For Pickett, authentically embodying her characters to reveal both personal truths and universally recognized themes is the driving force behind her work.

In choreographing full-length narrative ballets, Pickett invites the dancers “to bring personal research and experiences to their characters” (Bond Perry). As a choreographer, she values the collaborative nature of her work. In an interview with the Charlotte Ballet company, Pickett elaborates, “I believe this collaboration is give and take because it is a living art. As long as we are alive it is going to keep changing.” Collaboration is how she chooses to share and cultivate creativity. She continues to explain in the interview that “when people have a good time in the studio, the creativity elevates. We are all not afraid to try new things, to say ‘yes’ or ‘why not’ rather than ‘no’ or ‘why.’ Giving dancers responsibility gives them ownership and that’s where we start to thrive.”

Pam Tanowitz

Tanowitz was born in 1969 and grew up in Westchester County, outside of New York City (Burke). Like Tharp, ballet was not the foundation of her dance training, as she first started out taking modern and jazz classes in fourth grade and did not start ballet until high school (Burke). After graduating from college, she moved to New York and “quickly decided to focus on choreography rather than dancing for other people, partly because, by her own estimation, ‘I wasn’t a star dancer, at all’” (Burke). In 2000, she founded her own company so that she could explore choreographing with a consistent

community of dancers. In recent years, she has created works not only for ballet companies like New York City Ballet and The Royal Ballet but also for modern dance companies including the Martha Graham Dance Company and Paul Taylor American Modern Dance (“Biography”).

Tanowitz prefers a more non-narrative, experimental approach to choreography. She is often compared to Merce Cunningham, employing a similar use of balletic lines, shifts of weight and direction, complex footwork, and nonlogical or recognizably structured sequences. Her creative cultivation involves many self-assigned tasks and self-imposed restrictions; these limitations help her to generate new ideas. Siobhan Burke writes in a *Dance Magazine* article about Tanowitz: “A few years ago, she noticed that she often relied on walking as a transition. In her next dance, walking wasn’t allowed.” Unlike Tharp who prefers to create dances as different and opposite from one another as she can, Tanowitz is described by Melissa Toogood in Burke’s article as “a master recycler.” “To propel a new dance forward, Tanowitz often plucks material from her older works, finding new ways to reimagine it” (Burke). Her approach of breaking, or fragmenting movement, allows curiosity to develop. “Nothing is silly; nothing is off-limits to try or experiment with or manipulate or look at again or analyze” (Burke). For Tanowitz, creativity is cultivated through a fundamental sense of curiosity and a non-discriminating view of movement and ideas both new and old.

As to the driving force and what informs her work the most, Tanowitz says that it is her day-to-day exchanges with her dancers, “whose idiosyncrasies shape her work. ‘Ultimately, the dances I make are about the people in the room’” (Burke). Like Pickett, she gives space for her dancers to bring their personal qualities to her work. On a macro-

level, Tanowitz is highly aware of her lineage. “‘I don’t see myself as an individual choreographer doing my own thing,’ she says. ‘I’m always thinking about where I fit in on a timeline, and that informs what I make’” (Burke).

In conclusion, the concepts of bending, breaking, and blending can all be identified through the creative processes of these four choreographers. Nijinska utilized the existing classical form but bent its use to create a focus on movement, rather than positions, stories, and gestures. Tharp blends ballet with comedy, the Beach Boys, graffiti -- anything and everything that piqued her interest. Pickett thrives on the collaborative spirit, blending the stories of the individual with the embodied narratives to create authentic characters and universal themes. Tanowitz utilizes breaking and recycled material, taking fragments from her older works and using self-assigned rules to reimagine them in new ways. As creators, they all developed and shared their creativity in differing ways – teaching, routine, collaborating, etc. By using various strategies to manipulate existing ideas, they were or are able to hone their cognitive and creative skills to innovate time and time again.

Methodology

After examining the aforementioned neurobiological research and investigating its connection to the selected four female classical/contemporary choreographers, I began to assemble my performative project, organizing my choreographic process into three sections to correspond with the three cognitive strategies: bend, break, and blend, while taking examples from Nijinska, Tharp, Pickett, and Tanowitz’s creative methodologies to inform my own. Like Nijinska, I used the classical ballet idiom as a grammar of movement in Movement I, applying “bending” modifications to create an abstract

composition, and used Tanowitz's approach of self-imposed limitations to generate new outcomes. In Movement II, choreographic material was fragmented, discarded, rearranged, and recycled, and I used the concept of blackout poetry to write a new poem from an already existing one. Lastly, in Movement III, I infused Tharp's approach of blending into my choreography -- blending ballet with contemporary dance, Laban Movement Analysis effort factors, counterpoint and unison, and more.

Due to the uncertain nature of COVID-19 restrictions and closures, I decided to cast a small number of dancers, selecting two ballet dancers and two contemporary dancers. I also debated performing a solo within the work near the end as a synthesis of my blended dance lineage of traditional classical roots that led to contemporary forms. Although I yearned to choreograph for a live performance, I needed to be prepared in the case that lockdowns would re-occur and coincide with my projected timeline. Thus, I spoke to videographer Michelle Ou about different options and also researched various performance venues but plans remained fluid until mid-March 2022.

Rehearsal Process

Once casting was confirmed, I began to plan and organize rehearsal times and spaces. Rehearsal space was kindly provided by Alex Herrington at The North Dance Company in Aurora, Ontario for Part I - Bend, while Parts II and III - Break, and Blend, respectively, were rehearsed at The School of Toronto City Ballet in Scarborough, Ontario. Rehearsals began in October 2021 and were scheduled on a weekly basis, each session lasting 90-120 minutes. However, what initially was supposed to be a short break for the holidays in December turned into a seven-week hiatus because of yet another province-wide lockdown. This meant that my initial plan of presenting this project in late

February/early March was no longer possible, and so I had to postpone the performance date to April 9, 2022. Due to the lost time and the length of choreography required for Part III, rehearsals ended up increasing to 150-180 minutes each week.

The Choreographic Process

Movement I - Bend

The first section of this project was to investigate Brandt and Eagleman's notion of "Bending," with ballet dancers Deana Ou and Ivy Lin. Parallel to this choreographic process, I was researching the deficiency of creativity development within the ballet training and professional world in Professor Elizabeth McPherson's Dance in the United States course, as well as for the final Special Projects course with Professor Christian von Howard in the Fall 2021 semester. While at first, I was focused on the disparity between male and female ballet choreographers, I later decided to look at the deficiency of creativity cultivation within the dance form as a whole, while linking this to the neuroscientific research I had been examining.

In this first section, I chose to work with the raw materials of not only existing ballet repertoires but more specifically, materials that have been embodied by the dancers. Ou and Lin have both trained at The School of Toronto City Ballet for many years and competed in prestigious international competitions such as Youth America Grand Prix and the Genée International Ballet Competition. The meticulous training they had to prepare solo variations for such competitions meant that specific vocabulary and movement patterns were deeply ingrained and therefore easily accessible. However, neither of them had much experience with other styles of dance, movement improvisation, or composition and choreography. As such, I found that entering this

process collaboratively by drawing from their experience and physical memories allowed both dancers to feel more at ease. In our first rehearsal, I asked them to choose and recall a classical variation that they had previously performed. Ou chose a graceful Andante solo from Marius Petipa's *Paquita*, while Lin chose the exhilarating Diana variation from Petipa's *Diana and Actaeon*. These two variations became the raw material to which we applied Brandt and Eagleman's concept of "bending."

In working with Ou and Lin, I was interested in seeing how the integration of repurposing, modifying, or "bending" of existing variations could allow ballet dancers to access a fuller psycho-physical involvement while encouraging personal expression and creative investigation without sacrificing their technical or classical style. Throughout the choreographic process, I used ideas from Professor Claire Porter's Laban Movement Analysis course and concepts that were shared by the female ballet choreographers I had studied to cultivate creative thinking in Ou and Lin.

One example was Pam Tanowitz. Tanowitz's creative cultivation involves many self-assigned tasks and self-imposed restrictions, with which the limitations help her to generate new ideas. After asking Ou and Lin to recall their chosen variations, I used this idea of self-assigned tasks and restrictions by imposing tasks like dancing a certain section without the arms or without the legs, or anytime that there was something that was repeated within the phrase, to change it by size or speed, direction, etc. The use of tasks helped Ou and Lin to feel more comfortable with making creative decisions, as there was a framework available to guide them in the process. While it took a little time to adjust at first, by the second and third rehearsal they were both teeming with ideas and

would say things such as, “Can I try it like this?” “What about if I did it like this instead?”

Towards the latter part of the choreographic journey, I began to introduce more contemporary dance elements, taking the lines and shapes they were familiar with such as fourth positions and arabesques, and adding more foreign (to them) concepts, such as articulation and movement of the pelvis and spine, etc. I took movements such as grands jetés and grand rond de jambe en l’air and modified them by having them performed on the ground, thus introducing floorwork to Ou and Lin. Despite the addition of a more contemporary dance aesthetic, I continued to allude to Nijinska’s view of “the classical ballet idiom as a grammar of movement,” maintaining that change and modification to the form is natural and necessary in order for classicism to “stay alive,” rather than becoming a fossilized form.

In self-imposing the task of creating a dance piece by bending, refashioning, and recycling the raw materials and ideas around me, I was able to find freedom from the idea of creativity equating to originality, and share this with Ou and Lin. My hope was that this experience was able to act as the beginning of a new creative practice for them, coming from a fundamental sense of curiosity and a non-discriminating view of movement and ideas both new and old.

Movement II - Break

Rehearsals for this section began in mid-December 2021, but were halted after the first meeting until February 2022 due to the province-wide lockdown. This section featured two contemporary dancers, Kurumi Yoshimoto and Nidhi Baadkar, both of whom studied or are currently studying in the Professional Training Program at The

School of Toronto Dance Theatre. This creative process was quite different from the previous section because Yoshimoto and Baadkar both had ample experience with task-led creations and structured improvisation.

To investigate Brandt and Eagleman's notion of "breaking," I integrated knowledge and ideas that I gained from the creation of *Gravity*, a 360° dance film created in collaboration with writer Julian Lam during the Spring 2021 semester for Special Projects II and Application of Digital Media course. Firstly, we used a word phrase to develop a movement phrase. I assembled a list of words and expressions that had the word "break," such as "breakthrough" "to take a break" "breaking even" etc., and Yoshimoto and Baadkar each chose one to respond to improvisationally and later choreographically. We then added temporal breaks, intentionally breaking up a section or movement that was initially continuous. Knowing that "the human brain doesn't pay attention to everything it hears [or sees]" (Brandt and Eagleman 89), I asked Yoshimoto and Baadkar to watch each other's phrases and then asked them which parts or what movements they best retained in their memories. Those moments, serving as a synecdoche in which a fragment stood for the larger whole, were then incorporated into their individual phrases to create motifs and connections between the two. With a movement phrase that I developed, we explored other ways to physicalize fragmentation, such as having Yoshimoto perform the phrase in its entirety while Baadkar broke it into pieces, interjecting walking and pausing to alter the phrase.

Between the first and second rehearsal in February, I had a breakthrough. While I had initially considered creating an interlude between Movement I and II using spoken word, found sounds, and an atmospheric soundscape, I did not have clarity as to why I

wanted it, how it would relate to the choreography, or what purpose it would serve. I then came across a saved photo on my phone in which a body of text was blacked out except for three words - “creativity is subtraction”, and thus I stumbled upon blackout poetry. “Made popular in recent years by Austin Kleon’s *Newspaper Blackout*...the lineage of blackout poetry, or redacted poetry, actually traces back to the 18th century” (Offbeat Poet). The basic premise of blackout poetry is that an existing body of text, such as a book or newspaper article is taken and the poet crosses out the majority of the text, leaving behind only the words that create a new poem; “thereby revealing an entirely new work of literature birthed from an existing one” (Miller).

In my collaborative work with Lam for *Gravity*, he wrote a reverse poem in which the poem was first read from top to bottom, but then repeated from bottom to top to explore different perspectives on the repetitive cycles present in our lives. This poem, which had been tucked away in my archives, now presented me with the opportune material to create my own blackout poetry. After multiple attempts, I selected three of my newly created stanzas to use in this section of choreography. I fragmented the new poem even further, using repetition and pauses to create emphasis, and separated the stanzas to bookend the beginning and end of this section.

Similar to Movement I, the movement and the exploratory process took precedent over the music. Whereas I have often taken musical inspiration in the past to evoke choreographic choices, in this project my selection of music always came after movement phrases had been developed through the intended cognitive processes. For this movement, I chose a composition titled *^tre* by Nicolas Jaar, layering some ambient ocean sounds to the beginning and end to connect to the meaning of the blackout poem.

The sound of the ocean waves breaking on the shore sonically represented the concept of breaking, while also relating to the poetry. The blackout poem that I had written titled *The Ocean's Truth* spoke of large universal themes—such as the soul, the magnitude of the universe, the ocean, all existing within the smallest of entities—a spark, one breath, a single raindrop.

It was not until after choreography for this section was completed that I realized this composition by Jaar was actually a fragmented version, a “break,” of another composition of his titled *Être* in the same album. *Être* began with sounds of water and a man reciting a short piece of poetry. Then, another man recites two stanzas in French before the music begins. *Être* was the first song in the album, while *^tre*, the version without the water and without the lyrics, concluded it. Unknowingly, my arrangement of poetry and sounds coincided in a similar manner to Jaar's original composition, while my choreography explored fragmentation as he did as well.

Movement III - Blend

This final section was the longest one and marked the first time that all four dancers were dancing together. While I had originally planned to dance in this part myself, developing a three to five minute solo that would serve as a personal culminating experience, I quickly realized that I could not be “in” it and see it from “the outside” at the same time. Thus, I made the decision to ask Yoshimoto to co-develop and perform this instead. Although she is a contemporary dance artist, she also had an extensive ballet training background in Japan before moving to Toronto. Our styles of movement are quite different, but our pasts and our current paths have some complementary overlaps. She accepted this opportunity graciously, and together we created an improvisation score

consisting of spatial and temporal markers, as well as a framework for a “stream of consciousness” exploration.

This concept was taken from a writing practice, where one is “writing the first words or thoughts that go through your mind without actually planning or consciously thinking about what you are writing” (“How to Use Stream of Consciousness Writing”). It is often used as a release for thought and emotion as well as a way to better understand one’s own thought processes. Blending this writing technique with dance improvisation allowed Yoshimoto to abandon self-criticism and overthinking habits, “revealing thoughts and feelings below the surface...to raise [her] self-awareness” (“How to Use Stream of Consciousness Writing”). Later, I shared with her a line drawing that I made - a single line that looped and curved to create the image of a brain - and we used that to inspire movements, as well as spatial pathways that she could take during the stream of consciousness section. In this solo, she also took movements from the classical ballet variations that Ou and Lin chose to bend in Movement I and blended them with a contemporary aesthetic.

In conjunction with developing this solo, I also worked on the final ensemble piece. We workshopped choreographic material through the approach of body-to-body transference, where I gave Yoshimoto and Baadkar a task to create a phrase using two opposing Laban effort qualities - quick and sustained, or bound and free. Ou and Lin observed their physical processing and then transferred their observation into their own bodies. Layering Yoshimoto and Ou’s work together created an echo-like effect, similar to how light is refracted when it travels from air to water, or how a reflection in a still body of water is altered by the smallest of ripples. Conversely, I gave Ou and Lin the task

of each creating a phrase that included allegro jumps and easily identifiable balletic positions, essentially creating a short enchaînement. Then, Yoshimoto and I filled in the transitions and the moments between codified positions with contemporary aesthetic movement to create two blended phrases that seamlessly wove in and out of ballet and contemporary dance. Using contrasting Laban effort qualities, I blended direct and indirect pathways by having the dancers travel from the two upstage corners to their respective diagonals. On one side, they would run in a straight line, jump into the air and roll onto the ground. On the other side, they would run in a meandering, indirect pathway, emphasizing the effort quality with a rounded, curved gesture. The two pathway sequences were repeated multiple times, gradually overlapping more and more before dissolving into the next section of choreography.

Informed by Tharp's practice of blending old with the new, I meticulously combined and recombined material to generate new outcomes: ballet with ballet, motifs from Movement II with Laban effort qualities, ballet with contemporary dance, newly created phrases with old motifs, etc. I placed the four dancers in a diagonal line, alternating between the ballet and contemporary dancers to create a visual counterpoint of two contrasting blended phrases. Eventually, they converge into a unified stance, standing in fourth position facing the downstage left corner. A simple gesture of circling the arms is repeated but is infused with the individual's choice of timing and texture. The ending section features a unified phrase that acknowledges the convergence of the two forms, while still maintaining distinguishable differences in how the movements are physicalized by each individual dancer, blending their personal physical signature with that of the choreographer.

Prelude and Envoi

The opening piece ironically came at the very end, on our last group rehearsal before the performance. In reflecting on how this work can go beyond simply being a movement and cognitive exercise, a paraphrased quote by Elizabeth Gilbert in her book *Big Magic: Creative Living Beyond Fear*, provided the missing contextual information that I needed: “Creativity is the relationship between a human being and the mysteries of inspiration.” I then wrote a short script and asked Vanessa Demello, a dance artist and podcast creator who also recorded the recitation of *The Ocean’s Truth* for Movement II, to record this as well. This clarified the relationship between each of the two dancers in Movement I and Movement II - one dancer representing the human being, and the other physicalizing thought, memory, consciousness, and inspiration. In the concluding section of Movement III, the unison phrase dissolves as Baadkar, Ou, and Lin exit, leaving Yoshimoto to complete the phrase on her own before she walks to stage left and looks back at the traces of them. Although *Something Borrowed, Something New* was not based on a distinguishable narrative, I adopted concepts from Pickett’s methodology into my own, namely creating authentic archetypes through which the embodiment revealed both personal truths of each individual dancer as well as universally recognized and relevant themes. In sharing this quote and information with the dancers, their performance quality and intention were transformed.

Results and Implications for the Future

Something Borrowed, Something New was performed for both a live and virtual audience at The Collective Space in Toronto, Ontario, Canada on Saturday April 9, 2022. For safety, The Collective Space had capped the audience capacity to 30 people, while

over 30 other people attended the live stream through Zoom from Toronto, Windsor, Los Angeles, Phoenix, Atlanta, Salisbury, and even Hong Kong. Following the performance, I engaged in an open discussion and Q&A segment moderated by Negin Sairafi. We discussed the challenges of creating art through the pandemic, the creative and rehearsal process, some of the artistic choices made, and addressed questions, reactions, and feedback offered from both the live and virtual audiences. The audience was extremely receptive and responded favorably to the work. There was a mix of both dancers and non-dancers in the crowd, but comments about how the blended dance forms in Movement III were apparent, intriguing, and moving were abundant from both populations.

Furthermore, the post-performance feedback survey given to attendees provided deeper insight as to what they noticed, what they remembered, and when a neurological connection was made to create a lightbulb/ “aha” moment. When asked if they noticed any recurring movements or gestures throughout the work, 82% of respondents said yes, 9% said maybe, and 9% said no. Although an overwhelming majority of the responses were completed one to three days after the performance, 55% of respondents who answered yes were able to remember and identify specific gestures and moments.

Examples of responses include:

- “The part where the arm spun, stopped and recoiled.”
- “Shaking of the head and the arm swing and lean back.”
- “Excerpts from the classical variations.”
- “Intro entrance steps: grand jeté and similar walk steps”

- “Since I don’t have a dancer’s mind, it was hard to know exactly which moves, but parts of the final ensemble gave me deja vu—like I was seeing parts I had seen before coming together, even if I couldn’t explain how!”

Respondents were also asked if they experienced any “aha” moments during the work - if any moments prompted a feeling of something that “clicked” in their mind, or when they were able to establish a connection, etc. Again, 82% of respondents said yes, while the remaining 18% said maybe. Most of the respondents identified that this occurred for them during Movement III, saying:

- “In part 3 when all dancers were mirroring each other in their own style.”
- “During the culmination at the end where they hit a move together at the same time.”
- “The blend section, the blending of ballet and modern dance was very distinguishable.”
- “During the blend section I began to put things together and could easily see how the choreography from the different sections connected and resembled one another.”
- “Towards the end when all four dancers were circling the stage and weaving through each other. It communicated the paradoxical chaotic harmony where two worlds/identities strive for dominance; they collide and coexist in perpetual motion.”

Other comments pointed to how informative the Q&A was, and how the new information prompted the “aha” moments for them in retrospect. Some were surprised to hear that the choices in music came after setting choreography (at least part of it) first,

while others commented on how even though I was not physically a part of the performance, they were able to “see me,” in the work. Yiming Cai, a member of the audience, thoughtfully wrote, “When watching the work, I pondered about the title and it made me question if our pursuit of dance and technique can be seen as something borrowed from an accumulation of history. Perhaps everything in our pursuit of dance is a borrowing of something beyond us.”

Aside from being a personally fulfilling experience, using cognitive principles to aid in crafting choreographic material proved to not only be an effectual entry point into creative practice for dancers who have not had much experience with such, but also revealed to be an invigorating method for more seasoned artists as well. Working with existing movement material and recycled ideas challenges the notion that creativity emerges from a blank canvas or from thin air – that creativity must equate to originality in order to be successful. In-depth research of current cognitive sciences as well as the study of various accomplished choreographers offer a different perspective, in which a methodology that is grounded on modifying and fragmenting memories and intellect, then merging with novel sources, ideation, and imagination proves to be fruitful ground for choreographic inspiration and creative cultivation.

As a teacher of dance, I spend a lot of time on developing and refining the technical skills of my students, especially in the realm of classical ballet and conservatory-style training. Given that contemporary dance aesthetics are becoming increasingly incorporated into ballet repertoire and choreography, a broadening of pedagogical approaches which also include cultivating and nurturing creativity through such cerebral approaches would give students the agency to grow and develop their

artistic voices and technical skills simultaneously, providing an integrated mind and body practice.

At the same time, this research will concurrently continue to fuel new choreographic endeavors. *Something Borrowed, Something New* came to fruition through an intersectional study of science and art, and examining the relationship between the body and the brain. As more research is conducted and expanded information about the brain is revealed, phenomena such as body memory and adaptive unconsciousness would be of great interest to me to study through the lens of the body and the medium of dance. A synthesized relationship between mind and body, knowing and wondering, intellectual and visceral expression, can lead to work that is both grounding and expansive.

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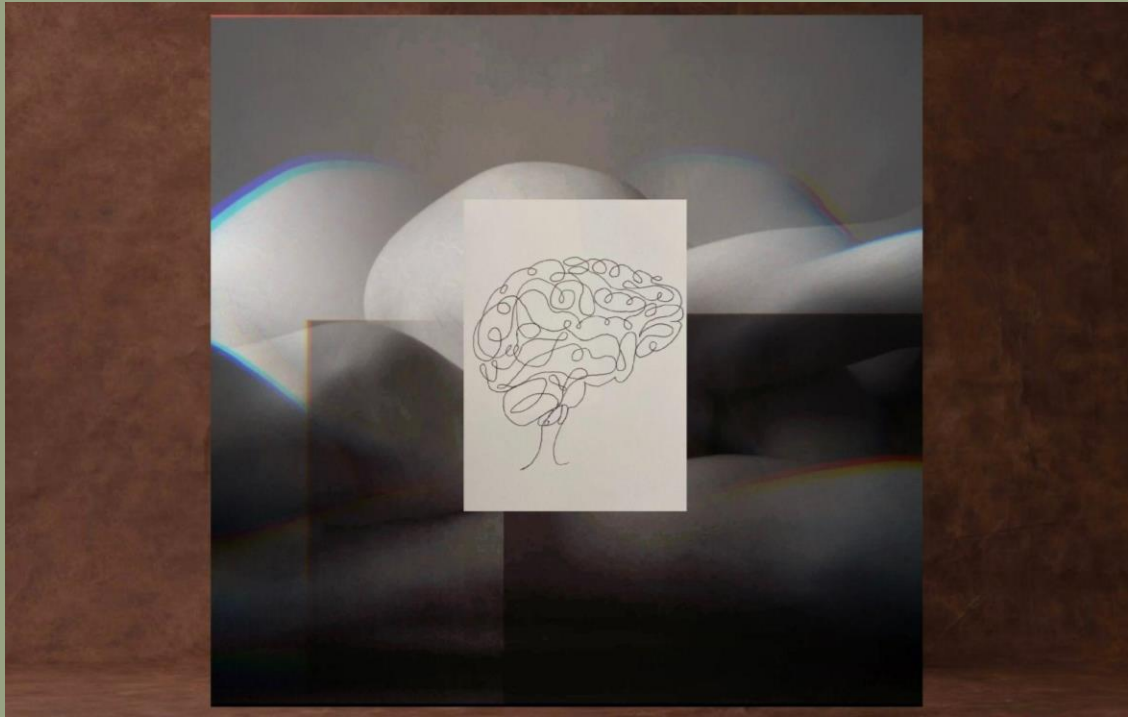
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Appendix: Thesis Concert Program



Something Borrowed, Something New

A cognitive and experiential exploration of the creative process

MFA in Dance Thesis Performance by Joyce Lo

April 9, 2022 @8pm

The Collective Space

221 Sterling Rd Studio 5

Toronto, ON M6P 3L4

The Program

Something Borrowed, Something New

World Premiere

Choreography: Joyce Lo

Part I - Bend

Music: Tigran Hamasyan

Voice: Vanessa Demello

Dancers: Deeana Ou, Ivy Lin

Part II - Break

Music: Nicolas Jaar

Poetry Recitation: Vanessa Demello

Dancers: Nidhi Baadkar, Kurumi Yoshimoto

Part III - Blend

Music: Marta Roma, Sarah Palu

Dancers: Kurumi Yoshimoto, Ivy Lin, Nidhi Baadkar, Deeana Ou

— Discussion/Q&A to follow —

The Choreographer

Joyce Lo



Born in Hong Kong and raised in Tkaronto/Toronto, Canada, Joyce Lo is recognized for her passion and creative versatility. She is a dance artist, educator, and choreographer whose movement practice is shaped by classical ballet, contemporary, and modern dance forms.

She graduated magna cum laude with a BFA Honours degree from York University, specializing in Dance Performance and Choreography. There she was privileged to study with esteemed faculty including John Ottmann, Julia Sasso, and Helen Jones, and was also awarded several fine arts awards and scholarships. She is now an MFA in Dance candidate at Montclair State University in New Jersey, USA.

Aside from her formal education and training in Toronto, Joyce has danced internationally in Los Angeles, New York, Tokyo, Rome, and Port of Spain, Trinidad. During the COVID-19 pandemic, she turned to creating, directing, and performing in dance films, and has had her various films screened in four international film festivals over the last two years. She is in constant search of inspiration; finding it in the simple and profound moments of everyday life.

The Performers

Kurumi Yoshimoto



Kurumi Yoshimoto is a Toronto-based dancer originally from Osaka, Japan. She trained at private dance studios and earned her B.A in Psychology in 2015 from Kwansai Gakuin University. In 2017, she came to Canada to study modern dance and danced at The School of Toronto Dance Theatre's Professional Training Program from 2018 to 2021. During the summer of 2019, she trained at the Alvin Ailey School in New York and also participated in ProArteDanza's summer intensive, which earned her an invitation to be an apprentice with the company for their 2019 Fall season. In 2021 she created a short dance film called "縁-En-" for SummerWorks Performance Festival and also had the opportunity to perform in the dance:made in canada Festival.

Deeana Ou



Deeana Ou is from Markham, Ontario and is currently completing her final year at York University's Faculty of Education in hopes to pursue a career as a secondary school educator for biology and French. Her ballet training started when she was 5 years old at The School of Toronto City Ballet and since then, she has participated in regional and global dance competitions like The 2015 Genée International Ballet Competition (now known as The Margot Fonteyn International Ballet Competition). She has explored other dance genres like contemporary dance and hip-hop but it was her deep-rooted passion for ballet that led her to develop her interest in teaching. She is currently preparing for her Royal Academy of Dance Solo Seal Award examination and hopes to continue to share her love for creating and learning through different art forms and opportunities.

Nidhi Baadkar



Nidhi Baadkar (she/her) is a professional dancer and movement artist with 12 years of training in Bharatanatyam and currently pursuing her contemporary dance training at The School of Toronto Dance Theatre. She is an alumni of Attakkalari Centre for Movement Arts, India and trained in various other forms like kalaripayattu, ballet, modern dance, physical theatre, and break dance. She has worked and performed in Bahrain, Canada, and India and is a certified facilitator in Therapeutic Dance in Education. She is also an artistic collaborator with Nautanki Creations.

Ivy Lin



Ivy Lin is currently in her first year of studying at York University for dance and education. She has been training at The School of Toronto City Ballet for over 12 years and enjoys ballet in particular because of its beauty, complexity, and physicality. Ivy has competed at various international ballet competitions such as YAGP, where she placed in the Top 12 for the Senior Classical category in 2019. She was also a semi finalist at the 2019 Genée International Ballet Competition held in Toronto. She hopes to continue to share her passion for dancing and is looking forward to what the future holds!



A Note from the Choreographer

The impetus for this creation came from a long-standing desire to understand how our brains work, where our ideas come from, and how to learn the skills needed to satisfy my itch to create. I've wanted to be a choreographer, long before I knew how to choreograph. In high school, I was always in awe of how my teachers and peers could seemingly pull ideas out of thin air, a sudden flash of brilliance enabling them to arrange a symphony of dancers or orchestrate riveting sequences across the space. How did they do it, and how could I learn to do the same?

The research that I came across in neuroscientist Anthony Brandt and musical composer David Eagleman's book *The Runaway Species: How Human Creativity Remakes The World* provided me with a framework that divided the landscape of cognitive operations into three basic (and easy to comprehend) strategies: bending, breaking, and blending. They suggest these are the primary means by which innovative thinking occurs, all of which involve taking existing concepts, knowledge, and experiences and refashioning them to create new outcomes.

Something Borrowed, Something New is a choreographic project that came to fruition through the intersectional study of art and science, and examining the relationship between the brain and the body. It stands at the edge of knowledge, seeing what we know, imagining what is yet to exist, and endeavors to fill the gap between the two.

Using the concepts presented by Brandt and Eagleman, [Part I - Bend](#) examines the abstraction of ballet, where two existing classical ballet female solo variations are modified and twisted to create something new. Using contemporary dance techniques, [Part II - Break](#), explores fragmentation, where sequences and motifs are taken apart, expanded on, and rearranged. [Part III - Blend](#), employs convergent thinking, where two or more sources, ideas, and dance forms are merged.

I am trying to create something that comes from our fundamental sense of curiosity and a non-discriminating view of ideas both old and new. Something cerebral yet physical, dancing in the space between knowing and wondering.